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(54) **Feeding and shearing apparatus for wrapping paper or other material.**

(57) The apparatus includes in combination: a support for a reservoir-reel (1), from which the tape (C) may be unwound by pull; a pair of motor driven rollers (3) for the controlled unwinding; a further pair of pressure rollers (5) control-operated like the motor driven rollers and with free-wheel coupling to allow the unwinding when the tape end is pulled; controlling means of the two pairs of rollers (3,5) for a predetermined and limited advancement of the tape, and a tape cutting means (7), operated upon the rollers stopping, to perform a cut in the section between the two pairs of rollers.

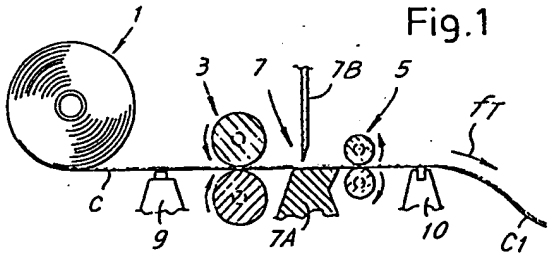

Fig.1

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TITLE MODIFIED
see front page

DESCRIPTION

The invention relates to an apparatus able to provide tape sections of paper or other material for wrapping or other uses, of predetermined size, which apparatus is particularly suitable for public and commercial business for the retail sale of foodstuff especially non pre-packaged, and for crêpe papers for sanitary or industrial uses; it is particularly suitable for the unwinding of paper or other thin material, as imposed by recent rules to avoid the wrapping tare in the weight of the product on sale.

Substantially, the feeding apparatus according to the invention comprises in combination: a support for a reservoir-reel from which the tape may be unwound by pulling action; a pair of motor driven rollers for the controlled unwinding; control means for the pair of rollers for a predetermined and limited advancement of the tape; a cutting means for the tape, operated after the rollers advancement and stopping, to perform the cut; and a pressure means, downstream of the cutting means, which is operated to act upon the tape in order to help the cut.

A means may be provided to achieve a slight restraint of the separated sheet, in order to allow its drawing but not its spontaneous moving away. The restraint

effect must cease at the moment the rollers advancement is operated.

The driving means may be controlled by a mark reader. Practically, the feeder may include a reader which detects the moving away of a piece of cut paper, and which thus causes the control of the rollers advancement.

A single reader, photocell or the like, may be arranged to cause the advancement starting in the absence of a piece taken away, and the stop in the presence of a mark.

The drawing shows non limitative exemplifications. In the drawing:

Figs. 1 to 3 show three constructions diagrams of a feeding apparatus, in a section perpendicular to the unwinding tape according to a plan parallel to the unwinding direction.

According to what is illustrated in the annexed drawing, referring first to Fig. 1, by 1 there is indicated a reel of thin papery material (or other equivalent) from which the tape - of paper or other - must be unwound to delivery sections of predetermined length for the use. The unwinding is operated through a motorized drive by a pair of unwinding rollers 3 and by a further pair of unwinding and pressure

rollers 5; the latter rollers 5 are driven through a unidirectional, that is, free-wheel joint, which allows a faster rollers rotation than the one caused by the motorized drive, which faster rotation serves to have the material located between said rollers 5 taken away when withdrawn from the outside by a pull of even limited value.

Between the two pairs of rollers 3 and 5 a cutter 7 is located, schematically represented, with a contrast part 7A for a blade 7B (but that can be made in any other suitable and known manner) for separating single sections of papery material or other indicated by C and for drawing the unit length so defined. When the paper tape unwinding stops, between the cut position defined by the blade 7B and the end of the unwound tape, a length of tape is present corresponding to the unit length of the section, which must be delivered. The cut achieved by the shearing device 7 will cause the separation of the section to be delivered, which remains retained between the standstill pressure and unwinding rollers 5, until a pull is exerted according to arrow f_T; by this pulling action the cut sheet, that is the section of desired unit length, is taken away, by a rollers 5 rotation allowed by the free-wheel joint.

By 9 there is indicated a reader and control device for stopping the motor driven rotation of the pairs of rollers 3 and 5; this device may be of photocell type aranged to cooperate with a printed mark, but it may be also of other type, for example, of electrical switch type cooperating with slots, or of magnetic type cooperating with magnetic inks or other. In any case, the device 9 determines the stopping of the tape unwinding to achieve the cutting and drawing of sections of predetermined length. In Fig. 1 this device is located upstream of the cutter as well as of the rollers 3. Downstream of the cutter 7 and, in particular, but not necessarily, downstream also of rollers 5, a feeler means 10 is provided - of mechanic type, photocell or other - which is able to detect the presence or the lack of paper in correspondence of the sight that it represents. This feeler means 10 is set to provoke the rotation start of the pairs of rollers 3 and 5 when it detects the absence of papery material on the sight and so when a section C1 of unit length, delimited by the cut operated by the cutter 7, 7A, 7B, has been drawn. The cutter is operated to perform the cut the moment the rollers 3 and 5 stop, mostly through the control of the reading device 9.

As a consequence - starting by a phase of tape C

unwinding from the reel 1 for the rotation of rollers 3 and 5 - at the arrival of the mark on the reader device 9, the delivery stops for the stopping of rollers 3 and 5, and the cutter 7 performs the cut; the section C1 remains in a condition to be easily withdrawn since it is kept by rollers 5, which, however, allow its sliding when a withdrawing pull is exerted on section C1; the section C1, when lying on the feeler means 10, causes the overall apparatus not to start again to operate the unwinding of tape C until the same section C has been taken away. At that moment, the rollers 3 and 5 will restart, to be stopped again when the reader 9 detects the arrival of a new mark.

In the embodiment of Fig. 2, whose references - equal to the preceding ones - indicate members which are equal to those illustrated in Fig. 1, there is provided a single reader and feeler device 19 (instead of members 9 and 10) located between the cutter 7 and the free-wheel rollers 5, this device being able to perform both the function of the mark reader 9 and that of the feeler means 10. In fact, a mark may be read even in a position in which the device 19 is located, and the latter may also detect the lack of papery material when the section C1 is withdrawn.

The described delivery apparatus - when used for

wrapping material - may be arranged on a sale bench or behind a sale bench, with a horizontal or vertical orientation and with the section prepared for the withdrawing which may be partly or fully sheathed for sanitary or protection purposes particularly in case of installation in restricted space. The apparatus may be also used for other purposes - as already mentioned - that is, for towels, toilet paper and other.

In the embodiment of Fig. 3 there are still provided members 1, 3, 7, 7B, 7A and 19 whose funtions are analogous to the ones described above. But in this case the rollers 5 are replaced by a presser 55, mostly resilient, which upon the cut by the blade, produces a strong action on the tape C for a good cut execution. After the cut, only a possible restraint effect of section C1 is required; this may be achieved by lifting the presser 55 together with the equipment 155 of the blade 7 thus reducing the pressure and the restraint effect on the section C1, or there may be provided for this purpose a specific presser 255 having a slight restraint action. Also the presser 255 or anything else providing analogous function, must be lifted to allow the free advancement of the material when rollers 3 are running.

According to a modified embodiment not shown, the rollers 5 may be non-motorized but simply developed for a unidirectional rotation. In this case they may perform a restraint action to ensure the regular cutting operation retaining the paper - when the blade is in action - together with the rollers 3 which, in this occasion, may be temporarily forced one against the other. Since they can rotate in the moving away direction of section C1, they permit such removal but have also a restraint effect against a spontaneous moving away. When the rollers 3 cause the material C to advance, the rollers 5 must be separated to allow this advancement.

It should be understood that the drawing shows an exemplification given only as a practical demonstration of the invention, since the invention may vary in the forms and dispositions without, nevertheless, departing from the ambit of the idea on which the invention is based. It is not excluded, for example, that the apparatus might be completed with a selector capable of quickly presetting different lengths of material to be delivered, by arranging the selector in two or more positions and by presetting groups of different marks or of differently aligned marks with different readers located in position or with a reader

differently positioned from the commutation means. This apparatus, in fact, does not require any pre-cut ting operation and thus the lengths are definable only by the reading mark and by the print which may be centered or replaced by a watermark, but which may also be continuous.

Moreover, provision may be made so that a single reader should control the unwinding start, and that the rollers rotation be limited in order to achieve the stop after a determined length of unwound tape.

The possibilities provided by the feeder are such that the material can be reeled - upstream - without pre-cutting operation and then with much higher productivity.

CLAIMS

1. A feeder of wrapping-paper or other material from reeled tape, also capable of supplying thin paper and with centered print or watermark, or a film or other, characterized by the fact of comprising in combination: a support for a reservoir-reel, from which the tape may be unwound by pulling action; a pair of motor driven rollers for a controlled unwinding; a pressure means downstream of the advancement rollers, for a temporary action of tape restraint; control means of the pair of rollers for a predetermined or limited advancement of the tape; a tape cutting

means, operated after the advancement and stop of the rollers, to perform a cut in the length included between the two pairs of rollers, and during the action of said pressure means.

2. A feeder according to the preceding claim, characterized by the fact of further including a restraint means of the cut tape section and to allow its withdrawing.

3. A feeder according to the preceding claims, characterized by the fact that the control means for the advancement are controlled by a mark reader.

4. A feeder according to the preceding claims, characterized by the fact of comprising a reader which detects the moving away of a piece of cut paper, and which thereby provokes the advancement drive of the rollers.

5. A feeder according to claims 1 and 3, characterized by the fact that the control means are developed to be actuated for a predetermined unitary advancement.

6. A feeder according to some of the preceding claims, characterized by the fact that a single reader, of photocell type or equivalent, placed at the length between the two pairs of rollers, causes the advancement start in the absence of a piece taken away, and the stop in the presence of a mark.

7. A feeder according to some of the preceding claims, characterized by the fact that the pressure means is made up of a second pair of rollers.

8. A feeder according to claim 7, characterized by the fact that the second pair of rollers is operated simultaneously to the advancement rollers for the advancement of the material between them, and is combined with free-wheel means, which allow the restraint of the cut section comprised between them and its moving away by the pull exerted by whoever withdraws the section.

9. A feeder according to claim 7, characterized by the fact that the second pair of rollers is free to rotate in one direction only in order to retain the section comprised between the two rollers and to allow its moving away by a pull by the user; the rollers of said second pair of rollers being separated during the advancement of the tape and able to be pressed to ensure the cut.

10. A feeding apparatus of wrapping-paper, crêpe paper, various films, starting from reeled tape, with automatic shearing and unwinding means; all as above described and represented for exemplification in the annexed drawing.

Fig.1

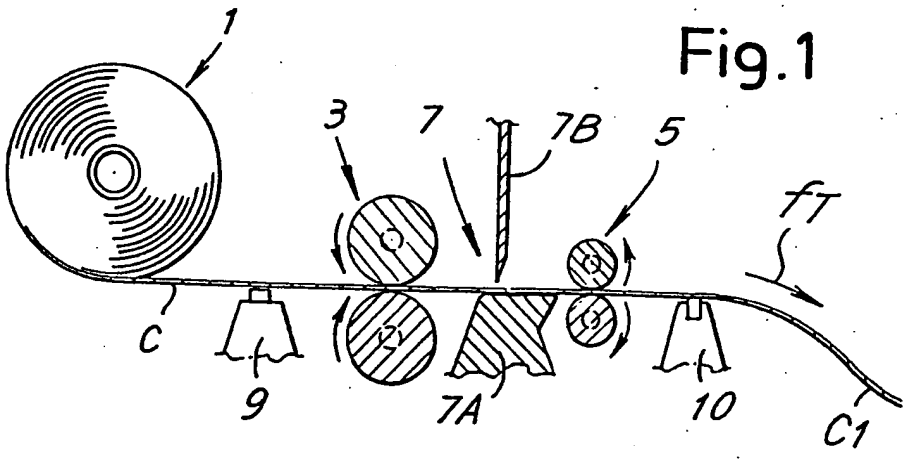


Fig.2

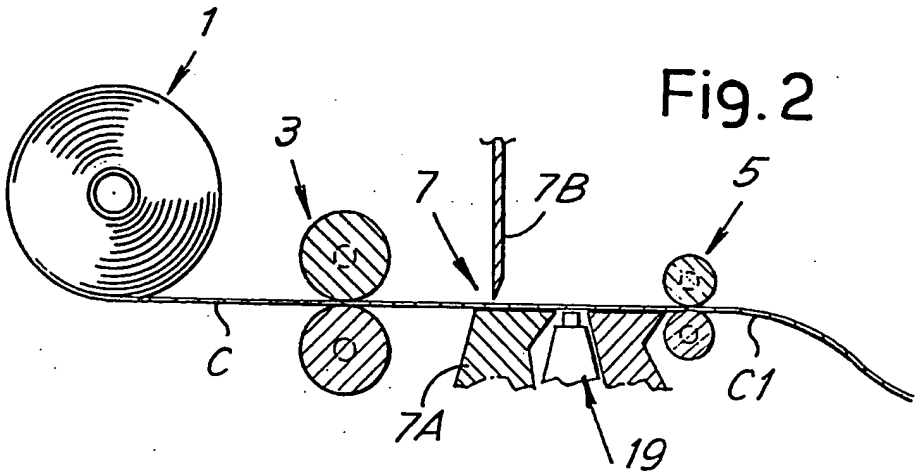
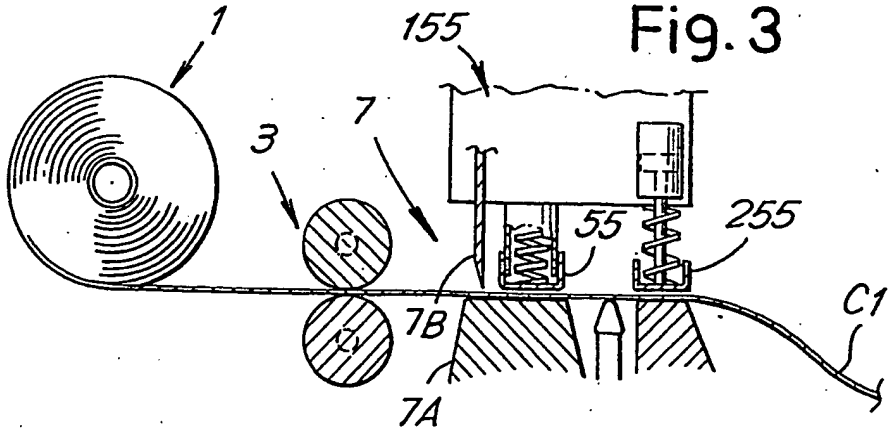


Fig.3



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EUROPEAN SEARCH REPORT

Application number EP 84830170.1

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
X	US - A - 2 695 171 (COFFMAN) * Fig. 1 * --	1,3,5	B 65 H 17/44 B 65 B 61/06
X	US - A - 3 237 973 (RUMBERGER) * Fig. 5 * --	1,3,5	
X	GB - A - 500 496 (INTERNATIONAL CIGAR M.C.) * Fig. 1 * --	1,3,5	
A	CH - A5 - 581 560 (SIG) * Totality * --	1,3-5	
A	SOVIET INVENTIONS ILLUSTRATED, sections P,Q week 82/25, August 4, 1982 DERWENT PUBLICATIONS LTD., London, Q 31 * SU-859 235 (ELEC PHOTOGRAPHI) * ----	1,7,8, 9	TECHNICAL FIELDS SEARCHED (Int. Cl. ³) B 65 H B 65 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	17-09-1984	HABART

EPO Form 1503 03.82

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document